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A STUDY OF SUBSPECIFIC VARIATION IN THE RICHARDSON POCKET-GOPHER (THOMOMYS TALPOIDES) IN NEBRASKA, WITH DESCRIPTIONS OF TWO NEW SUBSPECIES

By MYRON H. SWENK

There has been little published evidence of the occurrence of pocket-gophers of the genus *Thomomys* in Nebraska. Aughey (1) wrote in 1880: "The Northern Pocket Gopher *(Thomomys talpoides)* whose habitat is placed far north by Coues and Allen, I found on the north side of the Niobrara in north Nebraska." Cary (4) in 1902 simply recorded "*Thomomys* sp." among the smaller mammals noted on the sage brush plains of western Hat Creek Basin in Sioux County, but, as later explained by Swenk (11) this statement was based on a single skull specimen found by M. A. Carriker Jr. along Indian Creek, Sioux County, in the summer of 1901. Cary's original note read: "The only specimen of *Thomomys* taken was a skull which Mr. Carriker picked up in a dry wash along Indian Creek. Hills of a gopher which I took to be a *Thomomys* were often seen on the plateau."

Although the northern edge and most of the Panhandle of Nebraska are included by Bailey (3; p. 9) in his map of the distribution of the genus *Thomomys* in its entirety, and the ranges of *T. t. bullatus* and *T. t. clusius* are shown in another map (3; p. 28) as extending, respectively, into a small area in northwestern Nebraska and the southwestern corner of the Nebraska Panhandle, no definite records of the occurrence of *Thomomys* in the state are given in his revision, except that in his discussion of the origin of the type specimen of the *Geomys borealis* of Bachman (= *T. t. clusius)*, which specimen was collected by Townsend, he remarks: "Townsend in his Narrative (p. 59) mentions a pocket gopher which he picked up near Scotts Bluff, Nebr., at a point near the southeastern corner of what is now Wyoming. As the specimen was preserved and is the only specimen mentioned in the narrative, it may well be the type of Bachman's *borealis*." Bailey recorded also two specimens of *T. t. rufescens* from Fort Randall, Gregory County, South Dakota, just a few miles north of the Boyd County, Nebraska, line.

On geographic grounds, Swenk (12) first referred Townsend's Nebraska record to *T. t. clusius* and Aughey's and Cary's Nebraska records to *T. t. nebulosus;* but later (13), following Bailey's (3) maps, he referred Aughey's and Cary's records to *T. t. bullatus* and the *Thomomys* presumed to occur in the Boyd County, Nebraska, region to *T. t. rufescens.* Still later, after a careful search failed to reveal *Thomomys* in northeastern Nebraska in 1919, Swenk (14) entirely dropped *T. t. rufescens* from the Nebraska list.

It has recently been stated by Swenk (15) that "in that part of Dawes County lying north of the White River and Little Cottonwood Creek, and

in extreme northern Sioux County, north of Indian Creek, where the soil changes abruptly to a 'gumbo' (Pierre Clay from exposed and weathered Pierre Shale), the distribution of *Geomys lutescens* is ** cut off, and its place is taken by a form of *Thomomys.*" Following Bailey's (3) revision, as stated above on geographic grounds this form should be his *T. t. bullatus;* but it is quite distinct from that race, and it is now proposed to name it

Thomomys talpoides pierreicolus subsp. nov

PIERRE RICHARDSON POCKET-GOPHER

Type.—Wayside, Dawes County, Nebraska, September 24, 1919. Old adult ♂, skin and skull. C. E. Mickel, collector. Allotopotype adult ♀, skin and skull, September 23, 1919 (C. E. Mickel). Four ♂ topotypes, skins and skulls. Two ♂ and 1 ♀ paratypes, skins and skulls, from five miles northwest of Chadron, Dawes County (1 ♂, 1 ♀) and Indian Creek north of Story, Sioux County (1 ♂). Collection of M. H. Swenk. One ♀ from Sand Creek Valley near Horn, Dawes County, in collection of University of Nebraska State Museum.

Subspecific Characters.—Size small, about as in *T. t. talpoides* (Richardson) and *T. t. clusius* Coues; mammae in 6 pairs; claws slender; coloration of upperparts light, brownish gray; upper incisors abruptly decurved and with a very fine groove along inner front margin; molars small and light; skull rather short and wide, light, not strongly angular nor heavily ridged; rostrum shallow and slender, abruptly arched in front of upper molars; temporal ridges distinct in fully adult specimens, but slight and rather weak, subparallel, not or but slightly converging medially or anteriorly, even in old individuals; nasals very short, slender, truncate at posterior tips in old adults, truncate to more or less emarginate in young adults, distinctly emarginate in immature individuals; interparietal large, subtriangular; audital bullae rather long and narrow, not swollen or globose, well separated over the narrowed shaft of basioccipital; supraoccipital region not bulging posteriad but rising in a moderately steep curve over the foramen magnum.

Color.—Adults and juveniles in fresh late fall pelage (October). Anterior upperparts generally about Cinnamon-Drab[1], inclining toward a slightly more rufous tinge (approaching Fawn Color) on the crown, upper neck and lower cheeks, the regions before and below the eyes, around the ears and over most of the dorsum inclining toward Light Cinnamon-Drab, but fading dorso-ventrally on the sides and anteroposteriorly on the rump and base of tail, through Light Drab and Drab-Gray to the generally grayish white (pale buffy white on the belly) underparts and tail; throat and pockets pure white; ears and spot just behind them blackish; feet whitish. *Adults in early spring* (May). Like fall specimens, but slightly darker and more dusky, the anterior upperparts generally about Drab, inclining toward Cinnamon-Drab on the crown, upper neck and lower cheeks, and fading laterally and posteriorly through Light Drab to the buffy whitish underparts; throat and pockets white, tinged with very pale buffish. *Adults in early fall* (September). Like early spring specimens, but averaging slightly yet darker and more dusky rufescent, inclining somewhat from Drab toward Army Brown on the crown, upper neck and lower cheeks and toward Wood Brown on the upperparts generally, and fading laterally and at base of tail through Light Cinnamon-Drab and Ecru-Drab to the pale buffy whitish or dull whitish underparts.

Body Measurements (in mm.).—Of type ♂: Length, 217; tail, 75; hind foot, 26. Of allotopotype ♀: 207; 62; 28.

[1] Named colors are those of Ridgway, *Color Standards and Nomenclature* (1912).

Skull.—Measurements (in mm.). Of type ♂: Greatest basal length, 38.0; basal length, 36.0; basilar length of Hensel, 34.0; zygomatic breadth, 23.0; greatest breadth across squamosals, 19.3; breadth at postglenoid notch, 15.0; interorbital breadth, 6.0; height of cranium above palate, 13.8; height of cranium above basion, 11.8; upper molar series on alveoli, 7.5; length of nasals, 12.3; breadth of muzzle at root of zygoma, 7.1; greatest length of single half of mandible without teeth, 23.8; greatest breadth of mandible across angular process, 23.0. Of allotopotype ♀: 35.0; 32.1; 31.3; 21.7; 18.0; 15.3; 6.0; 12.5; 10.2; 7.0; 12.2; 6.8; 22.3; 22.1. (For extreme and average principal cranial measurements of 6 adult ♂♂ and 3 adult ♀♀ see Table 2).

Distribution.—Areas of soils of the Pierre series, including the Pierre clay and loam (Indian Creek, north of Story, Sioux County), Pierre silty clay loam and silt loam (Sand Creek Valley, northeast of Horn and 5 miles northwest of Chadron, Dawes County) and Pierre clay loam (Wayside, Dawes County), in extreme northwestern Nebraska. This is probably also the form occurring in the soils of the Pierre series as recorded by Bailey (3; p. 102) from southwestern and western South Dakota (Corral Draw, Pine Ridge Indian Reservation; Buffalo Gap and Elk Mountain, Custer County; Rapid City, Pennington County; Fort Meade and Smithville, Meade County; and Crow Buttes, Harding County), from the northern half of the eastern edge of Wyoming (Newcastle, Weston County, and Moorcroft, Crook County) and from extreme southeastern Montana (Alzada, Carter County). It is possible that this form may also range farther eastward in the Pierre soils of southwestern South Dakota, from the above-mentioned recorded localities eastward about to Armstrong, Stanley, Lyman and northern Tripp Counties, though there are no specimens known to have been collected in this area.

Relationships.—*T. t. pierreicolus* is a member of the *talpoides* group of the genus, as characterized by Bailey (3), having the rostrum slender and abruptly arched, instead of deep and evenly sloping, in front of the upper molars, and 6 pairs or more of mammae, instead of 4 or 5 pairs. It therefore needs no close comparison with the 29 described subspecies of *T. talpoides* that fall into Bailey's *fossor, douglasii, fuscus* or other groups now included (Goldman, 7) in that highly variable species, but some discussion of its relationships to the Missouri Valley races that fall into the *talpoides* group seems desirable.

Compared with the Saskatchewan Richardson Pocket-gopher, *T. t. talpoides* (Richardson) (10), of the grassy northern plains of the Joplin, Williams, Morton and Bainville series soil areas and associated soils of the Transition Zone in central and south-central Alberta and central Saskatchewan south into northern west-central Montana, *pierreicolus* is of about the same general body size but is distinctly longer-tailed, more slender-clawed and paler and browner in the color of its upperparts. The skull agrees with that of *talpoides* in the rather short and wide form, slender rostrum, lack of heavy ridges and subtriangular interparietal, but in adults the temporal ridges are subparallel, not or only slightly converging medially or anteriorly, even in old individuals, and the nasals are much shorter and in full adults truncate or but feebly emarginate at their posterior tips. Compared with the Dakota Richardson Pocket-gopher, *T. t. rufescens* Wied (16), of the grassy plains and prairies of the Fargo, Bearden, Williams, Morton, Bainville, Barnes and Parnell series soil areas and associated soils of the Transition Zone in southwestern Manitoba and the greater part of North Dakota, and in the Upper Sonoran Zone of northern and south-central South Dakota, *pierreicolus* differs at once in its much smaller body size and shorter hind feet, more slender claws, paler color, much lighter molar dentition, and much smaller and relatively shorter and lighter, less angular skull, with much shorter nasals, very much weaker temporal ridges and rather smaller audital bullae between a narrower basioccipital shaft.

On geographical grounds *pierreicolus* would be referred in Bailey's (3) revision to the Sage Richardson Pocket-gopher, *T. t. bullatus* Bailey (2, 3) of the western section of the central Great Plains—on the grass-covered soils of the Joplin, Williams, Morton and Bainville series and associated soils in the Transition and Upper Sonoran Zones of north-central and eastern Montana (recorded by Bailey from Fort Assiniboine; Darnalls Ranch; Piney Buttes; Johnson Lake; Cedar Creek, 15 miles north of Terry; Terry; Glendive; Red Lodge; Fort Custer and Powderville), extreme northwestern North Dakota (Buford; mouth of the Yellowstone River), and north east-central Wyoming (Clearmont; Powder River Crossing) and also the high desert sage brush covered soils of the Navajo and Chipeta series and associated soils in the Upper Sonoran Zone of north west-central Wyoming (Ishawooa Creek; Wind River; Sage Creek)—but adults of both sexes are much smaller in all body and cranial measurements; the coloration is paler; the claws are more slender; the skull in general is less angular, the temporal ridges distinctly weaker, the lambdoidal crest weaker; the audital bullae are decidedly smaller, less inflated and rounded; the nasals are much shorter, both actually and relatively; and the molar dentition is smaller.

Compared with the Pryor Mountain Richardson Pocket-gopher, *T. t. pryori* Bailey (2, 3) of the higher slopes at the edge of the Canadian through the Transition to the Upper Sonoran Zones of the Pryor Mountain and adjacent areas in Big Horn County, Montana, and with the Big Horn Richardson Pocket-gopher, *T. t. caryi* Bailey (2, 3) of the Canadian Zone of the Big Horn Mountains, Big Horn County, Wyoming, across the Big Horn River from *pryori, pierreicolus* differs at once in its duller, less rufescent or brownish coloration of the upperparts and smoother skull with less developed temporal ridges. It does not share the strongly projecting incisors and posteriorly pointed nasals of *pryori.* Compared with the Black Hills Richardson Pocket-gopher, *T. t. nebulosus* Bailey (2, 3), of the rough, thinly conifer-covered soil areas of the Underwood and Babb series and associated soils in the Canadian and Transition Zones of the Black Hills of South Dakota and Wyoming and (less typically) of the Bear Lodge Mountains of Wyoming, *pierricolus* differs, much as it does from *bullatus,* in its smaller body size and shorter hind foot, more slender claws, less angular skull with weaker temporal ridges, and lighter molar dentition, but its coloration is still paler and its audital bullae less decidedly smaller.

Compared with the Coues Richardson Pocket-gopher, *T. t. clusius* Coues (6), chiefly of the subhumid thinly conifer-timbered Underwood-Babb series soil areas and associated soils of the lower Canadian and Transition Zones (up to about 8,000 feet altitude) and the sage and other desert shrub-covered McCammon-Deschutes and Navajo-Chipeta series soil areas and associated soils of the Transition and higher Upper Sonoran Zones of the semi-arid to arid intermountain plateaus of the mountains of central Wyoming and north-central Colorado, together with adjacent Upper Sonoran semi-arid short-grass covered high plains areas of soils of the Joplin series along the eastern mountain slopes, in southeastern Wyoming and northeastern Colorado, *pierreicolus* agrees closely in size, color, slender claws, light molar dentition, narrowed basioccipital, etc., but differs at once in the longer rostrum, relatively longer and more slender skull, and especially the longer and much less swollen and globose audital bullae.

Compared with the apparently geographically isolated San Luis Richardson Pocket-gopher, *T. t. agrestis* Merriam (8) of the sage and other desert shrub-covered Navajo-Chipeta series soil areas and associated soils of the Transition and higher Upper Sonoran Zone of the San Luis Valley of south-central Colorado, *pierreicolus* differs in distinctly smaller size, darker coloration, lighter and less heavily ridged skull and smaller nasals.

Compared with the Large-eared Richardson Pocket-gopher, *T. t. macrotis* F. W. Miller (9), chiefly of the Weld and Fort Collins series soil areas and associated soils of the lower Transition and higher Upper Sonoran elevated divide between the Platte and Arkansas Rivers, in east-central Colorado, *pierreicolus* differs in much smaller size of body and skull, much paler coloration, lighter and less strongly ridged skull with weaker temporal ridges, and posteriorly truncate or but feebly emarginate nasals in the adult.

It has also recently been stated by Swenk (15) for Nebraska that "on the Cheyenne Table in the extreme southwestern part of Morrill County, the western two-thirds of Cheyenne County, the southern one-third of Banner County, and all of Kimball County, *G. lutescens* drops out entirely on the uplands, where it is replaced by *Thomomys.* * * In Banner County it *(Geomys)* is locally common in the valley of Pumpkin Creek in the northern part of the county, and in Bull Canyon in its western part, southward up the slopes of the Cheyenne Table nearly to its top, where it again drops out and is replaced by *Thomomys.* * *" Following Bailey's (3; pp. 28 and 100-101) revision, on geographic grounds this *Thomomys* of the Cheyenne Table should be *T. t. clusius*, and it has repeatedly been so recorded by Swenk (11, 12, 13, 14); but it differs sufficiently from typical *clusius* from southeastern Wyoming as to deserve separation as a distinct race, which it is now proposed to name

Thomomys talpoides cheyennensis subsp. nov.

CHEYENNE RICHARDSON POCKET-GOPHER

Type.—Two miles south of Dalton, Cheyenne County, Nebraska, June 26, 1919. Old adult ♂, skin and skull. C. E. Mickel, collector. Allotype adult ♀, skin and skull, from nine miles south of Kimball, Kimball County, June 12, 1919 (C. E. Mickel). Paratopotype adult ♂, skin and skull, June 26, 1919 (C. E. Mickel). Two ♂ and 1 ♀ paratypes from four miles north of Sidney, Cheyenne County (1 ♂) and 10 miles north of Kimball, Kimball County (1♂, 1♀). Collection of M. H. Swenk.

Subspecific Characters.—Agrees with the preceding characterization of *T. t. pierreicolus*, but color of upperparts averaging slightly more vinaceous gray; molar dentition distinctly heavier; skull slightly longer, more slender and more strongly angular, much heavier and more strongly ridged in adult ♂♂; temporal ridges in fully adult specimens better defined, much stronger and closer together in old adults, approximately parallel; nasals much longer, truncate or nearly so at posterior tips; audital bullae distinctly larger, moderately full, with shaft of basioccipital more narrowed anteriorly; interparietal larger; and suproccipital region rising more abruptly over foramen magnum.

Color.—Adults and juveniles in early summer pelage (June). Very like May and September specimens of *T. t. pierreicolus* in the general tone of coloration, but upperparts averaging slightly more vinaceous gray and less dusky, about between Drab and Wood Brown but closest to the latter, and fading laterally and posteriorly through Vinaceous Buff and Tilleul-Buff to pale buffy whitish or dull whitish underparts.

Body Measurements (in mm.).—Of type ♂: Length, 225; tail, 66; hind foot, 29. Of allotype ♀: 225; 66; 26.

Skull.—Similar to that of *T. t. clusius* but slightly more slender and somewhat heavier and more angular; the temporal ridges stronger in old adults; the nasals broader and much longer, their posterior tips more truncated; the audital bullae smaller and less globose in form; the shaft of basioccipital broader anteriorly; the interparietal larger and especially longer, less broadly triangular; and the molar dentition slightly heavier.

From that of *T. t. rufescens* the skull differs in slightly smaller size and narrower form, and in having broader audital bullae which are separated by a much lighter and narrower basioccipital shaft. Compared with the skull of *T. t. talpoides*, that of *cheyennensis* is smaller and rather longer and narrower, with the nasals about truncate rather than emarginate at posterior tips and the temporal ridges approximately parallel rather than converging anteriorly. Measurements (in mm.). Of type ♂, in the same sequences of measurements as detailed in the preceding description of *pierreicolus*: 40.0; 36.0; 34.0; 24.5; 19.0; 14.9; 6.0; 14.0; 11.0; 8.0; 15.0; 6.3; 23.0; 22.0. Of allotype ♀: 39.2; 35.3; 33.1; 22.5; 18.8; 15.0;

TABLE 1.—*Extreme and average body measurements in millimeters of Thomomys talpoides subspp. from the Missouri Valley region*

Locality	Specimens			Total Length			Tail Vertebrae			Hind Foot		
	No.	Age	Sex	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum
T. t. talpoides:												
Borden, Sask. (3)	1	Ad.	♂			214.0			60.0			28.0
Do.	1	Ad.	♀			210.0			60.0			29.0
T. t. rufescens:												
Ft. Clark, N. D. (3)	1	Ad.	♂		240.0			70.0			31.0	
Do.	1	Ad.	♀		230.0			70.0			31.0	
T. t. bullatus:												
Powderville, Mont. (2, 3)	2	Ad.	♂	238.0	240.0	242.0	72.0	74.0	76.0	30.0	30.0	30.0
Do.	1	Ad.	♀		225.0			78.0			29.0	
T. t. pierreicolus:												
Sioux and Dawes Cos., n.w. Nebr.	7	Ad.	♂	193.0	207.7	220.0	56.0	63.3	75.0	26.0	27.3	28.0
Do.	6	Ad.	♀	199.0	206.5	212.0	58.0	64.7	73.0	26.0	27.0	28.0
Do.	2	Imm.	♂	137.0	162.0	187.0	52.0	58.0	64.0	26.0	26.5	27.0
Do.	2	Imm.	♀	177.0	180.0	183.0	56.0	56.0	56.0	24.0	25.0	26.0
T. t. andersoni:												
Medicine Hat, Alta. (7)	3	Ad.	♂	198.0	200.3	204.0	54.0	57.7	59.0	27.0	27.7	29.0
Do.	5	Ad.	♀	193.0	196.0	201.0	50.0	55.0	60.0	25.0	26.0	27.0
T. t. pryori:												
Pryor Mts., Mont. (2, 3)	1	Ad.	♂		210.0			60.0			29.0	
Do.	2	Ad.	♀		201.0			53.0			28.5	
T. t. caryi:												
Big Horn Mts., Wyo. (2, 3)	2	Yng. Ad.	♀	196.0	199.5	203.0	54.0	56.0	58.0	26.0	27.0	28.0
T. t. nebulosus:												
Sand Creek Canyon, Wyo. (2, 3)	1	Ad.	♂		230.0			66.0			32.0	
Do.	4	Ad.	♀		226.0			65.0			31.5	
T. t. clusius:												
Bridgers Pass, Wyo. (3)	1	Ad.	♂		205.0			66.0			28.5	
Do.	7	Ad.	♀		204.0			60.0			27.0	
T. t. cheyennensis:												
Kimball-Cheyenne Cos., s.w. Nebr.	5	Ad.	♂	194.0	209.0	225.0	51.0	56.2	66.0	26.0	27.6	29.0
Do.	4	Ad.	♀	195.0	207.7	225.0	55.0	61.2	66.0	26.0	27.2	28.0
Do.	3	Imm.	♂	150.0	170.7	185.0	42.0	50.3	55.0	25.0	25.7	26.0
T. t. agrestis:												
San Luis Valley, Colo. (3)	1	Yng. Ad.	♂		205.0			50.0			30.0	
Do.	1	Ad.	♀		212.0	220.0		55.0	57.0		29.0	30.0
T. t. macrotis:												
Parker, Colo. (9)	3	Ad.	♂	227.0	231.3	240.0	54.5	57.0	60.0	29.0	30.7	32.0
Do.	4	Ad.	♀	225.0	227.7	230.0	53.0	57.0	60.0	27.0	28.2	30.0

6.0; 13.0; 10.2; 7.2; 14.1; 6.2; 23.2; 22.8. (For extreme and average principal cranial measurements of 4 adult ♂♂ and 2 adult ♀♀ see Table 2).

Distribution.—Areas of soils of the Rosebud series, including the Rosebud loam, silt loam, gravelly sandy loam and, less extensively, the fine and very fine sandy loams of the short-grass covered Upper Sonoran Zone high plains of Kimball, southern Banner and western Cheyenne counties, in the extreme southwestern corner of the Nebraska Panhandle. This is almost certainly the same form that has been recorded under the name *T. t. clusius* as occurring in the soils of the Rosebud series in the Upper Sonoran Zone of extreme northeastern Colorado, at Avalo (3) and at Chimney Cliffs 30 miles northwest of Sterling (5,100 feet) (5) in northwestern Logan County, at Pawnee Buttes and thence westward and northward to the Wyoming boundary (5) in northeastern Weld County, and in extreme southeastern Wyoming at Pine Bluffs, Laramie County (3).

TABLE 2.—*Extreme and average cranial measurements in millimeters of Thomomys talpoides subspp. from the Missouri Valley region*

Locality	Specimens			Basal Length			Zygomatic Breadth			Mastoid Breadth			Length of Nasals		
	No.	Age and Sex		Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum
T. t. talpoides:															
Borden, Sask. (3)	1	Ad.	♂		34.5			23.0			19.0			14.0	
T. t. rufescens:															
Ft. Clark, N. D. (3)	1	Ad.	♂		40.0			25.0			22.0			15.5	
T. t. bullatus:															
Powderville, Mont. (3)	1	Ad.	♂		37.6			24.0			20.3			15.5	
T. t. pierreicolus:															
Sioux and Dawes Cos. n. w. Nebr.	6	Ad.	♂	32.3	33.1	36.0	21.0	21.9	23.0	18.5	18.9	19.3	12.0	12.3	12.8
Do.	3	Ad.	♀	32.1	32.4	32.7	21.6	21.9	22.7	18.0	18.3	18.6	11.8	12.2	12.5
Do.	1	Imm.	♂		30.5			19.5			17.8			11.5	
T. t. andersoni:															
Medicine Hat, Alta. (7)	1	Ad.	♂		36.5			20.8			18.1			13.0	
Do.	1	Ad.	♀		37.0			22.2			19.0			12.8	
T. t. pryori:															
Pryor Mts., Mont. (3)	1	Ad.	♂		34.0			22.0			18.5			12.5	
T. t. caryi:															
Big Horn Mts., Wyo. (3)	1	Yng. Ad.	♀		32.5			20.5			18.0			12.0	
T. t. nebulosus:															
Sand Creek Canyon, Wyo. (3)	1	Ad.	♂		37.7			24.3			20.0			14.3	
T. t. clusius:															
Bridgers Pass, Wyo. (3)	1	Ad.	♂		33.4			22.0			19.5			13.0	
T. t. cheyennensis:															
Kimball and Cheyenne Cos., s.w. Nebr.	3	Ad.	♂	32.3	34.4	36.0	21.7	22.7	24.5	18.2	18.6	19.0	13.0	14.0	15.0
Do.	2	Ad.	♀	34.3	34.8	35.3	21.5	22.0	22.5	18.5	18.6	18.8	13.8	13.9	14.1
Do.	1	Imm.	♂		25.3			18.0			15.8			8.5	
T. t. agrestis:															
San Luis Valley, Colo. (3)	1	Ad.	♀		38.0			23.5			19.7			15.0	
T. t. macrotis:															
Parker, Colo. (9)	3	Ad.	♂	37.0	38.3	41.0	22.0	25.0	27.0	20.0	20.7	22.0			
Do.	4	Ad.	♀	37.0	37.2	37.6	23.0	24.0	25.0	19.5	20.2	20.6			

As to whether the Colorado records of *T. t. clusius* from eight miles south of Seibert and at Flager, both in Kit Carson County, and from Limon, in Lincoln County, as well as from Colorado Springs, El Paso County (3, 5, 9), all Upper Sonoran Zone localities, apply to *cheyennensis* or to *macrotis* is at present undetermined. Cary (5), before the differentiation of the two last-mentioned forms, recorded *clusius* as "common on the higher western end of the Arkansas Divide, from a point 8 miles south of Seibert west to the base of the mountains at Colorado Springs", much of which area lies in the Transition Zone. F. W. Miller (9) hints that the racial affinities of the animals from these localities probably lie with his *macrotis*, but finds that animals from Beaver Creek, in extreme northeastern Elbert County, and from Bijou Creek, at the Elbert-El Paso County line, are more or less intermediate between *clusius* and *macrotis*. The other Colorado records of *clusius*—from Canadian Creek in North Park, Jackson County, where the animals "accord well with" typical *clusius* according to Cary (5), and from Estes Park, Larimer County, and Gold Hill and Boulder, Boulder County, where the animals are "apparently intermediate in some respects between *T. clusius* and *fossor* of the higher mountains" according to Cary (5), may probably safely be referred to *clusius*.

The Wyoming records of *T. t. clusius* published by Bailey (3) from Cheyenne, Fort Russell, Islay and Little Bear Creek 20 miles southeast of Chugwater, all in Laramie County; from Rawhide Buttes (5,400 feet) in Goshen County; and from 15 miles southwest of Wheatland (5,200 feet) in Platte County, which localities all lie in the Transition Zone, are probably correctly so referred, though these places border closely to the known range of *cheyennensis*. Other Wyoming localities of occurrence given by Bailey (3), that practically without question refer to typical *clusius*, include Sherman, Woods, Laramie Mountains east of Laramie (8,500 to 9,000 feet), Bear Creek 3 miles southeast of Laramie Peak (7,500 feet), Springhill 12 miles north of Laramie Peak, and Rock Creek, all in the Transition or Canadian Zones in Albany County; Beaver (Transition), Douglas and Fetterman (both Upper Sonoran) in Converse County; Ferris Mountains (7,800 to 9,400 feet) and Shirley Mountains (7,600 to 8,800 feet) (Canadian), 40 miles southwest of Casper (probably Transition), Bridgers Pass (Transition) and Fort Fred Steele (Upper Sonoran), all in Carbon County; Green Mountains (8,000 feet), 22 miles southeast of Myersville, Myersville and Miners Delight, all in the Transition or Canadian Zones of southeastern Fremont County; north base of Rattlesnake Range (Transition-Canadian) and Sun (Upper Sonoran), Natrona County; Redbank (Transition), Washakie County; and Dayton and Parkman (Transition), Sheridan County.

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